

CASE REPORT

A case of solitary paraaortic lymph node recurrence of lung squamous cell carcinoma after resection

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Abstract : Solitary abdominal paraaortic lymph node recurrence after radical lung cancer surgery is very rare. Here, we report a case of a solitary abdominal paraaortic lymph node recurrence of lung squamous cell carcinoma (SCC). A 63-year-old man was diagnosed with lung SCC (cT1cN0M0 stage IA3), underwent a video-assisted right lower lobectomy (ND2a-1), and the pathological findings showed SCC (pT1cN0M0 stage IA3). The EGFR mutation and ALK translocation statuses of SCC were negative, and adjuvant therapy was not performed. Follow-up positron emission tomography – computed tomography (PET/CT) showed a solitary fluorodeoxyglucose (FDG)-concentrated region in the swollen paraaortic lymph node. A paraaortic lymph node biopsy was performed by open laparotomy, to determine the precise diagnosis and identify the genetic status. Pathological findings revealed that the paraaortic lymph node contained poorly differentiated SCC, which was thought to metastasize from the lung cancer. The genetic status of the lymph node recurrence revealed a lack of EGFR mutations, ALK translocations, and ROS1 mutations, while the tumor proportion score (TPS) of PD-L1 was 55%, and we therefore administered pembrolizumab, an immune checkpoint inhibitor. Biopsies are very important for achieving precise diagnoses and determining the genetic statuses of tumors, since molecular-targeting drugs and immune checkpoint inhibitors are available. *J. Med. Invest.* 65 : 283-285, August, 2018

Keywords : lung squamous cell carcinoma, solitary paraaortic lymph node recurrence

INTRODUCTION

Abdominal paraaortic lymph node metastasis is defined as a distant metastasis in the General Rule for Clinical and Pathological Record of Lung Cancer, 8th Edition (1). In this disease, the direction of lymph flow in the thoracic cavity favored the cranial side, although lymph flow directionality is complicated. We report a rare case of solitary paraaortic lymph node recurrence after radical surgery for lung squamous cell carcinoma (SCC).

CASE REPORT

A 63-year-old man, who displayed an abnormal shadow on chest radiography, was referred to our hospital. Past disease history included hypertension, hyperlipidemia, type 2 diabetes mellitus, and emphysema. A chest computed tomography (CT) exam showed a 22 × 18 mm nodule in the right S10 segment and bilateral interstitial pneumonia (Fig. 1). Histological findings, via bronchoscopy, revealed lung SCC. Positron emission tomography - CT (PET/CT) showed a concentration of fluorodeoxyglucose (FDG) only in the primary lesion, and the maximum standard uptake value (SUVmax) was 8.28 in the lesion. The interstitial pneumonia was complicated by high levels of disease markers, including KL-6 (610 U/ml, normal range < 500 U/ml) and SP-D (264 ng/ml, normal range < 110 U/ml). We diagnosed the patient with lung SCC cT1cN0M0, stage IA3, using the General Rule for Clinical and Pathological Record of Lung Cancer, 8th Edition (1) and performed a video-

assisted right lower lobectomy (ND2a-1). Pathological findings showed poorly differentiated SCC, pT1c, pN0, pM0, pT1c (3 cm), pT1cN0M0 pstage IA3; EGFR mutation and ALK translocation were negative. Adjuvant therapy was not performed for interstitial pneumonia, and a follow-up PET/CT, which was performed 15 months after the operation, showed a single FDG-concentrated area in the paraaortic lymph node. The SUVmax was 5.6 in the lesion (Fig. 2), and enhanced CT, gastrointestinal fiberoptic, and colon fiberoptic showed no malignant primary lesions in the abdominal cavity. We suspected that the patient had an atypical, solitary paraaortic lymph node recurrence of the lung cancer. We performed a paraaortic lymph node biopsy, via open laparotomy, to achieve a precise diagnosis and determine the cancer gene status. The target lymph nodes were identified in the round celiac trunk and superior mesenteric artery, and two adjacent lymph nodes were resected (Fig. 3). Pathological findings showed that both paraaortic lymph nodes contained poorly differentiated SCCs, which were thought to have metastasized from the lung cancer (Fig. 4). The lymph nodes were EGFR mutation negative, ALK translocation negative, and ROS1 mutation negative, and the tumor proportion score (TPS) of PD-L1 was 55%. We administered pembrolizumab to the patient as first-line therapy, because the TPS of PD-L1 was greater than 50% (2); however, the patient presented with interstitial pneumonia, with an unusual pattern, as a complication. Following treatment with pembrolizumab for half of a year, the patient did not show any recurrence, but experienced grade 1 hypothyroidism as an adverse effect from pembrolizumab, according to the Common Terminology Criteria for Adverse Events (CTCAE) v 4.0.

DISCUSSION

Lymph node lung cancer recurrences tend to occur in regional

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Figure 1. CT scan showing a 2-cm tumor in the right S10, with bilateral interstitial pneumonia.

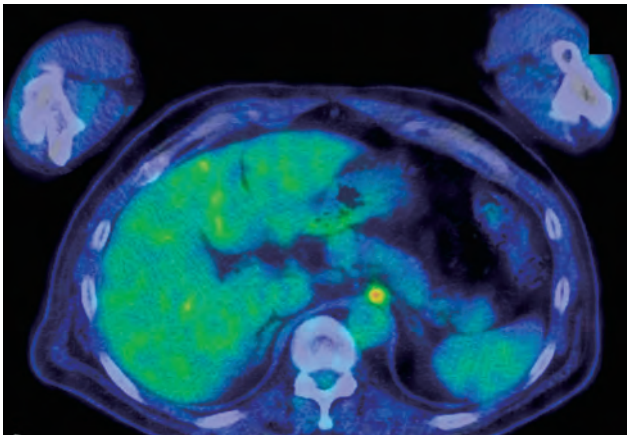


Figure 2. PET/CT scan showing a FDG-concentrated region in the paraaortic lymph node. The SUVmax was 5.6.

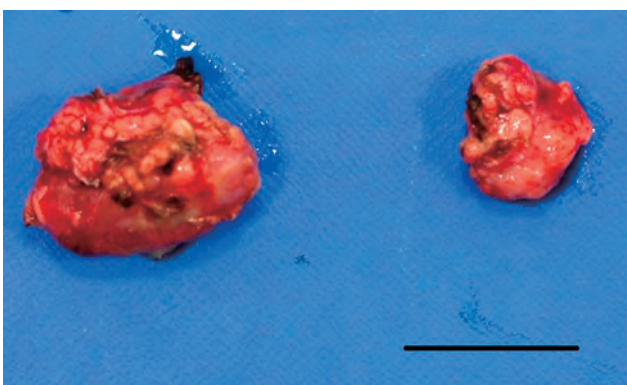
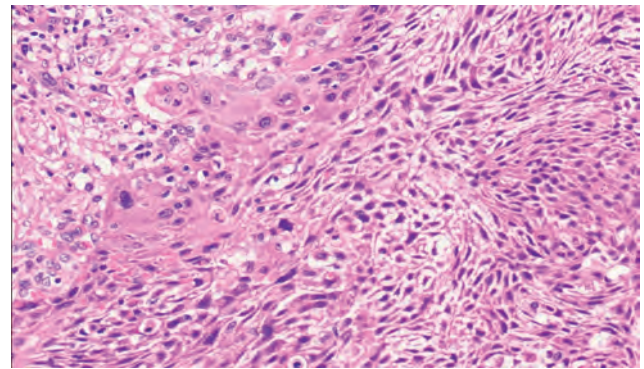


Figure 3. Resected specimens. The black line is 20 mm.

A



B

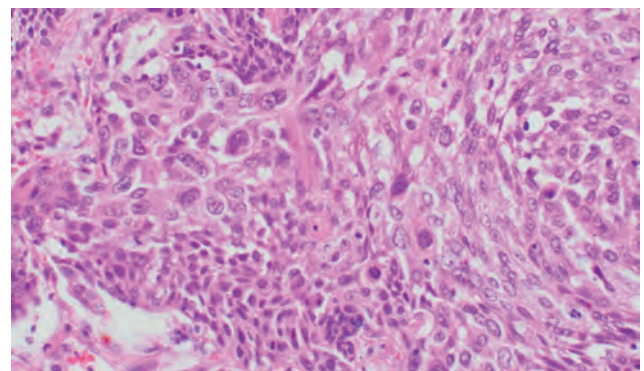


Figure 4. HE staining ($\times 400$). 4a) Squamous cell carcinoma of the paraaortic lymph node. 4b) Squamous cell carcinoma of the lungs, at first surgery.

lymph nodes, such as the N1, N2, or N3 regions. Abdominal paraaortic lymph node recurrences are defined as distant metastasis by the General Rule for Clinical and Pathological Record of Lung Cancer, 8th Edition (1). Solitary abdominal paraaortic lymph node recurrences are rare after pathological N0 surgery, although sometimes present as complications of multiple systemic metastases. Anatomically, the right S10 segment of the lung was near the celiac trunk lymph node, as a solitary recurrence. The lymph and thoracic ducts connect the mediastinum and the abdominal cavity, and penetrate the diaphragm via the esophagus hiatus, aortic hiatus, and foramen of vena cava. However, this pattern of lymph flow is rare, and generally, lymph flow is directed into the cranial side of the thoracic cavity. In addition, the surgical findings of this case showed no obvious lymph ducts near the tumor, toward the mediastinum. Therefore, it may be possible that cancer cells at the S10 region of the lung metastasized via this diaphragm route. Nowadays, sentinel lymph node navigation systems have been reported (3), and if sentinel navigation systems of lung cancer can be established, they would be useful for this case, where we suspected a specific pattern of lymph flow into the thoracic cavity.

We initially suspected that the lymph node metastasis originated from the malignancy in the abdominal organs or lymphadenitis; however, additional examinations did not reveal malignancies in the abdominal organs. We performed lymph node dissection to achieve a precise diagnosis and determine the gene mutation status. We identified a substantial increase in the TPS of PD-L1, and therefore, administered an immune checkpoint inhibitor as a personalized therapy.

Currently, biopsies are important for confirming diagnoses and identifying genetic mutations and immune checkpoint gene expression statuses. Generally, EGFR, ALK, and ROS1 should be investigated as genetic mutations of lung cancer, because of the available therapeutics in the Japanese market in 2017. In future, we may need to examine a greater number of genetic mutations using next generation sequencing (4-6). Additionally, it is essential to identify the TPS of PD-L1 for immune checkpoint inhibitors, especially in squamous cell carcinomas (7, 8), and re-biopsies are commonly performed upon EGFR-tyrosine kinase inhibitor (TKI) treatment failure. Re-biopsies can successfully identify the resistance gene, for example EGFR T790M, and the accuracy of re-biopsies have been reported to be 79.5-80.7% (9, 10). If the T790M mutation is identified in cancer tissues, we can administer osimertinib to the patient (11, 12). Biopsies of unclear malignant lesions are important for such cases, and especially for unexpected metastatic lesions. Furthermore, biopsies of aggressive diseases allow precise diagnoses, identification of target gene mutation statuses, and determination of the TPS of PD-L1.

Biopsies of abdominal paraaortic lymph nodes are usually performed via laparotomy, as in this case. There are no reports of percutaneous needle biopsies and/or endoscopic needle biopsies for abdominal paraaortic lymph nodes.

In this case, we reported the rare recurrence of solitary abdominal paraaortic lymph node from lung SCC. It is of increasing importance to perform biopsies for suspicious recurrent lesions, because biopsies not only allow improved diagnoses but also allow the identification of target gene expression statuses and improve diagnoses over clinical imaging tools.

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest. The manuscript submitted does not contain information about medical device(s)/drug(s). No funds were received in support of this work and there were no relevant financial activities outside the submitted work.

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